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18 September 1962

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NRO REVIEW COMPLETED

PHOTOGRAPHIC EVALUATION REPORT

Mission 9040
28, 29, 30, 31 July ZFE No. 33-62

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Referral Review by NGA/DoD

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PART I - FORWARD CAMERA

Mission No: 9040 Filter, Main: Wratten 21
Camera No: 82 Filter, Horizon: Wratten 25
Slit Width: 0.200" Evaluated By: TK, CL, ES
Film Type: J-23-7600 (S0 132)

1. Shutter Operation: Possible horizon camera shutter malfunctions are found recorded within the terrain format area. Examples: pass D08, frames 89-91; pass A16, frames 10, 13, 14, 18-21, 25, 26, 28, 30.
2. Horizon Camera Exposure:
 - a. Supply (Port): Good throughout mission where not affected by low sun angle. (f/6.8 with a 1/200 second average speed).
 - b. Take-Up (Starboard): Same as supply (Port).
3. Camera Number: Operational throughout mission except where a second or third binary is exposed at the camera-off position. The number is legible with good exposure.
4. Binary Operation: The binary functions throughout the mission; however, no index lights appeared when a second or third binary is recorded at the camera-off position. It is difficult to determine the on-off condition for binary lights 16 and 17.
5. Film Metering:
 - a. Supply (Port) Horizon Camera - Metering averages 0.20".
 - b. Take-Up (Starboard) Horizon Camera - Metering averages 0.22".
6. Film Tracking: Normal throughout the mission.
7. Timing Pulses: Well defined, and recorded outside of the terrain format area. After the first quarter of a frame, however, the pulses appear as double images. At the "camera-off" position the pulses may extend to the supply edge of the terrain frame or abruptly end as much as 12.7" from supply edge of the terrain frame.
8. Fiducials:
 - a. Main Camera - The center fiducial and the 3" off-center fiducial appear ragged throughout the mission.
 - b. Horizon Cameras - These are well defined with no flare present.
9. Light Leaks: A diagonal light leak is found at the beginning of most passes in frame 2. Occasionally it will appear in the next-to-last frame of a pass. A general fogging type of light leak is also present affecting about 1/10 of a frame in the last, or next-to-last frame of most passes. In addition, a bar-shaped pattern is present in the last, or next-to-last frame of a few passes. The image formed by this light leak is identified as an equipment image shadow which has been identified in a later mission.
10. Static Electricity: The possible corona static fogging becomes evident in pass D07, and thereafter is present throughout the mission. Characteristically, the 6.3" spaced fogged pattern appears in approximately frame 6 and becomes much more dense as the mission progresses. This pattern ceases after approximately 1/3 of the frame preceding the "camera-off" position. Approximately 90% of the film is degraded and of this amount, 20% is seriously degraded-negating its use for photographic interpretation procedures. Edge static is present in pass D25, frames 90-95; pass A45, frame 2. In addition, a heavy static spot is occasionally found within the terrain format associated with the possible horizon camera shutter malfunction. Examples: pass D07, frames 85-88; pass A16, frame 85; pass A32, throughout most of the pass. Small static

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marks are present in the film-clamp area adjacent to the horizon camera images in most passes.

11. Pinholes: These are present intermittently throughout the film.
12. Abrasions and Scratches: Present intermittently throughout the photography. Examples: pass A01, frames 1, 18, 40, 42, 45-49, 56-58; pass D07, frames 10, 18, 48, 50, 54, 66, 77, 91; pass A16, frames 21, 39, 51, 63, 77.
13. Tearing: None.
14. Water Marks: None.
15. Pressure Streaks: Small base rubs are present throughout the film.
16. Processing Streaks: None could be definitely defined during examination of the photography. Mottling, however, was found in pass D08, frame 57.
17. Blistering and Crimping: Blisters are evident intermittently on the film. Examples: pass D41, frames 34, 47, 48; pass D52, frames 6, 35, 75, 154, 155. Crimping is also present intermittently. Examples: pass A17, frame 7; pass D23, frames 71, 72, 75, 95; pass D31, frames 7-10.
18. Contrast: Low 15%, medium 82%, high 3%.
19. Apparent Resolution: Image quality is only fair due to a general out-of-focus appearance of the photography, and is comparable to mission 9035. Imagery of the forward camera is not as good as that obtained by the aft camera.
20. Apparent Granularity: Fine.
21. Photo Quality:
 - a. Main Camera - Quality is poor in this mission due to fogging present in 90% of the film in addition to the presence of intermittent scratches, lifted emulsion, creases and a few blisters.
 - b. Horizon Cameras - The port horizon camera produced a good image with no out-of-focus areas and in most instances adequate exposure, therefore a rating of good is assigned to the photography. The starboard horizon camera, although the exposure is adequate, produced multiple images, thus a rating of poor is assigned to the photography.
22. Camera Operation:
 - a. Main Camera - A rating of poor is given due to the presence of fogging which is detrimental to 90% of the mission. The end-of-pass marker does not operate throughout the mission, and in addition, a double or in some instances a triple binary exposure is recorded at the camera-off position. The second and third binary recordings, when present, do not show the camera number nor the binary index lights.
 - b. Horizon Cameras - The starboard horizon camera imagery is poor due to out-of-focus and the presence of multiple images. The port horizon camera images have good exposure.
23. Suitability for PI: Due to fogging affecting 90% of the photography, a rating of poor is given to this mission.

Remarks:

1. At the trailing edge of the film there is a heavier than usual gross fog density which resembles fogging due to a light leak. The dark area gradually dissipates as it reaches the trailing edge of the terrain format. This condition is present throughout the photography. The density gradient varies from approximately 0.24 to 0.18 and is quite evident on the original negative.

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2. Handling marks are found intermittently throughout the mission. These include crimps (the majority of which may be attributed to film handling after the receipt of the mission from the processor); grease pencil marks, as in pass D07, frame 69; fingerprints, as found in pass A50, frames 76, 78, 120; and foreign matter, present in pass D09, frames 16, 52, 68, 75, 78, 85.
3. A more or less uniform base fogging is present in some passes. This fogging is possibly due to exposure of the film to radiation. Examples: passes A02, D07, D17, D23, A33, A40 and A52.
4. Lacquer within the format was found in pass A50, frames 80, 81.
5. Few desensitized spots were found in this film. Examples: pass A16, frames 11, 32; pass A17, frame 61; pass A47, frame 25.
6. Streaking of high density imagery into low density areas is present intermittently throughout the film.
7. The following are descriptions of overlap and film transport for Camera Number 82 as determined from approximately the fifth and the last frames of each pass where possible. Cloud cover, low sun angle and no imagery may have precluded determination of these values in some passes.

Pass	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
	Beginning Percent	End Percent	First Frame	Last Frame
A01	5	10	NM	9.0"
A02	5	9	NM	9.3"
D07	4	7	7.3"	21.0"
D08	Clouds	6	NM	15.0"
A09	2	3	NM	5.8"
D09	2	6	NM	14.3"
D15	less than 1	4	13.3"	15.4"
A16	2	10	NM	9.3"
A17	0	5	NM	None
D17	3	5	None	13.0"
D23	Clouds	7	11.0"	15.2"
D24	5	5	NM	15.5"
D25	9	7	NM	16.3"
A30	5	Clouds	13.7"	8.0"
A31	2	5	NM	9.0"
D31	5	8	NM	16.0"
A32	10	9	NM	10.8"
A33	1	11	NM	9.5"
A40	3	5	7.7"	6.3"
D40	5	7	4.9"	14.4"
D41	5	6	NM	15.1"
A45	10	13	13.1"	10.1"
A46	8	11	NM	11.4"
A47	5	13	NM	10.3"
A49	9	13	NM	None
D49	10	11	None	13.5"
A50	10	Clouds	11.5"	11.1"
D50	10	12	NM	14.9"
A51	10	Clouds	12.9"	None
D51	5	Clouds	None	14.2"
A52	3	Clouds	13.8"	None
D52	1	10	None	17.0"
D53	7	5	14.1"	15.5"
D54	4	8	NM	15.7"
A63	5	End of Mission	14.0	End of Mission

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Note: NM denotes "Not Measurable"

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8. Density readings were taken on every pass using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment. Absolute values read for D Max and D Min as well as Gross Fog are given below. Uniform Gross Fog readings and static D Max columns have been added to this report in order that degradation of film due to these factors may be made available for further study.

<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Uniform Fog</u>	<u>Static D Max</u>	<u>Sun Angle*</u>
A01	45	2.08	0.76	0.19	----	----	
A02	56	2.06	0.72	0.19	1.42	----	
D07	47	2.12	0.90	0.30	1.13	----	
	69	2.10	1.03	0.28	0.37	----	
D08	65	1.90	1.00	0.26	----	0.78	
	90	1.60	0.62	0.21	----	----	
A09	2	1.62	0.48	0.22	----	1.97	
D09	19	2.10	0.87	0.22	----	1.00	
	80	2.04	0.74	0.21	----	0.82	
D15	9	2.06	0.43	0.18	----	2.02	
A16	8	1.71	0.74	0.22	----	1.42	
	85	1.15	0.65	0.23	----	2.10	
A17	4	1.88	0.90	0.24	----	1.68	
	132	1.96	0.74	0.21	----	1.84	
	161	1.64	0.61	0.22	----	1.84	
D17	14	2.06	0.96	0.22	0.84	1.40	
D23	69	2.12	1.10	0.30	1.26	1.59	
	101	2.14	1.20	0.35	0.40	1.60	
D24	29	2.14	0.90	0.22	----	----	
	125	2.08	0.68	0.26	----	1.80	
D25	2	2.06	0.67	0.23	----	1.40	
	76	2.10	1.42	0.23	----	1.94	
A30	8	1.98	0.50	0.24	----	1.70	
A31	6	1.72	0.52	0.16	----	1.56	
D31	17	2.06	0.85	0.18	----	2.14	
A32	5	1.72	0.57	0.18	----	1.52	
	89	1.95	0.82	0.21	----	1.84	
A33	6	1.48	0.50	0.18	1.10	1.55	
A40	6	1.52	0.52	0.27	0.94 - 0.40	----	
D40	22	2.04	0.62	0.24	----	1.79	
	77	1.98	0.78	0.26	----	1.79	
D41	46	2.07	1.09	0.20	----	1.63	
A45	23	2.04	0.47	0.20	----	1.64	
A46	70	1.50	0.65	0.22	----	1.82	
	115	2.00	0.84	0.20	----	1.22	
A47	10	1.80	0.50	0.20	----	1.85	
	76	1.82	0.75	0.30	----	1.80	
A49	15	1.60	0.37	0.18	----	1.64	
	92	1.84	0.94	0.22	----	1.92	
D49	8	2.00	0.76	0.22	----	1.84	
	76	1.92	0.54	0.21	----	2.14	
A50	9	1.20	0.56	0.16	----	1.78	
	78	1.46	0.83	0.17	----	1.83	
D50	2	1.54	0.62	0.20	----	2.04	
A51	44	1.97	0.59	0.23	----	1.82	
	77	2.01	0.78	0.22	----	1.98	
D51	4	1.94	0.82	0.19	----	2.20	
A52	7	1.96	0.62	0.24	0.98	1.50	
D52	2	1.94	1.18	0.28	----	1.70	
	119	2.08	1.02	0.25	----	1.75	
	158	2.02	0.89	0.24	----	2.02	
D53	5	2.08	0.72	0.30	----	1.65	
	107	2.04	0.94	0.22	----	1.30	
D54	22	2.04	0.95	0.22	----	1.58	

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<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Uniform Fog</u>	<u>Static D Max</u>	<u>Sun * Angle</u>
D54	150	1.68	1.03	0.20	----	1.38	
	151	1.69	0.84	0.21	----	1.22	
A63	5	1.52	0.62	0.27	----	2.19	

Average D Max 1.88
Average D Min 0.77
Average Gross Fog 0.23
Range D Max 1.15 - 2.14
Range D Min 0.37 - 1.42
Overall Range 0.37 - 2.14
Range Gross Fog 0.16 - 0.35

* The Sun Angle data was not available for enclosure in the Photographic Evaluation Report at time of publication, however, upon compilation of this data, it will be published as an addendum to this report.

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PART II - AFT CAMERA

Mission No: 9040 Filter, Main: Wratten 21
Camera No: 83 Filter, Horizon: None
Slit Width: 0.200" Evaluated By: TK, CL, ES
Film Type: J-23-7600 (SO 132)

1. Shutter Operation: A possible horizon camera shutter malfunction occurred intermittently during this mission. It is not as intense nor did it occur as often as in the forward camera. Examples: pass D08, frames 4, 6, 16, 18, 19; pass A16, frames 30, 52, 76, 84, 85; pass A32, frames 46, 47, 55, 75, 85, 88, 90; pass D40, frames 40, 95-105.
2. Horizon Camera Exposure:
 - a. Supply (Starboard) 1/200 second at f/8 setting results in an overexposure of the horizon image. The image is out-of-focus.
 - b. Take-Up (Port) 1/200 second at f/8 setting results in overexposure of the horizon image. The image is in focus.
3. Camera Number: Operational throughout the mission except after the first of a multiple binary exposure at the camera-off position. The number is legible with good exposure.
4. Binary Operation: The binary functions throughout the mission; however, no index lights appear when a second or third binary is exposed at the camera-off position. It is difficult to determine the on-off condition of binary lights 16 and 17.
5. Film Metering:
 - a. Supply (Starboard) Horizon Camera - Metering averages 0.17".
 - b. Take-Up (Port) Horizon Camera - Metering averages 0.18".
6. Film Tracking: Normal throughout the mission.
7. Timing Pulses: These are outside of the format area but are not as well defined as those of the forward camera. Double images are recorded and the exposure density is rather thin. At the "camera-off" position the pulses may extend to the supply edge of the terrain frame or end as much as 0.5" from the supply edge. A complete timing pulse recording was usually made for the aft camera which was not as erratic as the forward camera timing pulse recording.
8. Fiducials:
 - a. Main Camera - The center fiducial and 3" off-center fiducial appear ragged throughout the mission.
 - b. Horizon Cameras - These are well defined with no flare.
9. Light Leaks: A diagonal light leak is found at the beginning of most passes in frame 2. Occasionally it will appear in the next-to-last frame at the end of a pass. A general fogging type of light leak is also present affecting about 1/10 of a frame in the last or next-to-last frame of most passes. The image formed by this light leak is identified as an equipment image shadow which has been identified in a later mission.
10. Static Electricity: The possible corona static fogging first becomes evident in pass D07 and thereafter is present throughout the film with the exception of pass A40. The fogging is not as detrimental to imagery as it is in the forward camera. Approximately 90% of the photography is degraded and of this amount approximately 10% is seriously degraded. Edge static is present intermittently throughout the film. Examples: pass D08, frames 36, 37; pass D17, frames 10, 11; pass D23, frames 7-10, 16-18, 21, 24-26, 29, 30, 42, 43, 45. In addition, other static found within the terrain format may be found in pass A01, frame 52; pass D07, frame 7; pass A45, frames 11-17, 19. Small static marks are present in the film-clamp area adjacent to the horizon camera images in most passes.

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11. Pinholes: Present intermittently throughout the film.
12. Abrasions and Scratches: Occur intermittently throughout the photography. Examples: pass A01, frames 4, 11, 34, 39; pass D08, frames 10, 12, 40, 42, 47, 77, 79, 93; pass D51, frames 2-49; pass D53, frames 1-37; pass A63, frames 1-10.
13. Tearing: None.
14. Water Marks: None.
15. Pressure Streaks: Small base rubs are present throughout the film.
16. Processing Streaks: None.
17. Blistering and Crimping: Blisters are present intermittently. Examples: pass D24, frames 75-77; pass A46, frames 68, 75, 93, 131.
18. Contrast: Low 1%, medium 98%, high 1%.
Note: Contrast ratios were determined in areas not affected by fogging caused by corona static.
19. Apparent Resolution: Image quality is fair due to a general out-of-focus appearance of the photography, and is comparable to mission 9035. Imagery of this camera is slightly better than that obtained from the forward camera.
20. Apparent Granularity: Fine.
21. Photo Quality:
 - a. Main Camera - Quality is fair in this mission due to fogging present in 90% of the film in addition to the presence of intermittent scratches, lifted emulsion and a few blisters. Fogging was not as detrimental as that of the forward camera.
 - b. Horizon Cameras - Quality of the horizon camera image is poor due to overexposure.
22. Camera Operation:
 - a. Main Camera - A rating of fair is given due to the presence of fogging affecting 90% of the photography. Generally, the fogged areas are not as dense as that found in the forward camera. The end-of-pass marker operates throughout the mission. A double or triple binary is recorded at the camera-off position in most passes. The second and third binary recordings when present, do not show the camera number nor the binary index lights.
 - b. Horizon Cameras - Since both horizon cameras were overexposed, the image was entirely too dense to determine the quality of the imagery.
23. Suitability for PI: Due to fogging affecting 90% of the photography, a rating of fair is given as the degradation of the film is not as great as that of the forward camera.

Remarks:

1. At the leading edge of the film there is a heavier than usual gross fog density which resembles fogging due to a light leak. The dark area gradually dissipates as it reaches the leading edge of the terrain format. This condition is present throughout the film. The density gradient varies from approximately 0.24 to 0.18 and is quite evident on the original negative.
2. Handling marks are found intermittently throughout the film. These include crimps (the majority of which may be attributed to film handling after the receipt of the mission from the processor); fingerprints, as found in pass A02, frames 26, 56; pass A50, frames 74, 92, 123. Foreign matter is present intermittently throughout the photography. Examples: pass D09, frames 4, 56, 74; pass D23, frames 44, 45, 47, 75; pass A46, frames 5, 14, 34, 41, 42, 51, 59, 60, 63, 90, 133-135; pass A50, frame 93 (insect).

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3. A more or less uniform base fogging is present in some passes. This fogging is possibly due to exposure of the film to radiation. Examples: passes A02, D07, D17, D23, A33, A40, A52.
4. Lacquer within the format occurs occasionally. Examples: pass D49, frame 79; pass A50, frames 107-110, 114, 115; pass D50, frames 17, 32, 39, 40; pass A51, frames 30-32; pass D54, frames 1, 134, 141, 146, 148-150.
5. Transfer of titling opaquing (spots) occurs intermittently throughout the film along the leading edge. Occasionally, spots may be found within the terrain format area.
6. Streaking from high density images into low density areas is present intermittently throughout the photography. Examples: passes D24, D25, D40 and A49.
7. The following are descriptions of overlap and film transport for Camera Number 83 as determined from approximately the fifth and last frames of each pass where possible. Cloud cover, low sun angle and no imagery may have precluded determination of these values in some passes.

Pass	Overlap (Percent)		Film Transport (From Take-Up Side in Inches)	
	Beginning Percent	End Percent	First Frame	Last Frame
A01	4	9	NM	9.9"
A02	3	12	NM	10.6"
D07	5	10	NM	18.0"
D08	3	7	13.9"	15.7"
A09	2	5	NM	6.5"
D09	3	8	6.4"	16.3"
D15	1	9	14.2"	16.3"
A16	4	14	NM	10.1"
A17	4	14	None	None
D17	3	12	None	14.0"
D23	3	10	12.2"	16.1"
D24	10	12	14.2"	16.7"
D25	5	10	4.8"	17.5"
A30	Clouds	Clouds	15.0"	8.7"
A31	4	8	NM	10.1"
D31	9	10	NM	17.1"
A32	10	14	14.9"	12.0"
A33	2	7	9.9"	10.6"
A40	4	5	8.6"	7.0"
D40	7	8	5.0"	16.5"
D41	5	8	14.5"	16.1"
A45	10	15	14.2"	10.8"
A46	10	13	NM	12.6"
A47	10	13	10.6"	11.4"
A49	9	14	9.3"	11.2"
D49	11	10	NM	14.8"
A50	10	Clouds	12.6"	12.2"
D50	10	11	NM	15.9"
A51	12	Clouds	13.9"	13.0"
D51	Clouds	Clouds	NM	16.7"
A52	4	Clouds	16.7"	None
D52	6	10	None	17.5"
D53	7	7	15.2"	16.1"
D54	Clouds	8	14.2"	16.6"
A63	9	End of Mission	15.0"	End of Mission

Note: NM denotes "Not Measurable"

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8. Density readings were made on every pass using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment. Absolute values read for D Max and D Min as well as Gross Fog are given below. Uniform Gross Fog readings and static D Max columns have been added to this report in order that degradations of film due to those factors may be made available for further study.

Pass	Frame	D Max	D Min	Gross Fog	Uniform Fog	Static D Max	Sun * Angle
A01	45	2.12	0.83	0.20	----	----	
A02	56	2.12	0.90	0.21	1.46	----	
D07	49	2.10	0.88	0.24	0.54	----	
	82	2.10	1.15	0.24	0.54	1.96	
D08	64	1.64	0.88	0.22	----	----	
	84	1.60	0.98	0.22	----	----	
A09	10	1.85	0.58	0.23	----	----	
D09	38	2.18	0.70	0.21	----	----	
	85	1.96	0.97	0.21	0.38	1.54	
D15	16	1.96	0.37	0.20	----	----	
A16	43	1.86	0.51	0.24	----	1.30	
	84	1.30	0.68	0.23	----	1.74	
A17	7	1.82	0.80	0.21	----	1.64	
	86	2.08	0.62	0.24	----	1.40	
	151	1.94	0.64	0.23	----	1.32	
D17	2	1.95	0.55	0.22	1.40	1.40	
D23	75	2.10	0.90	0.25	1.00	----	
	95	2.10	1.00	0.24	----	2.20	
D24	2	2.12	0.72	0.24	----	1.64	
	92	2.10	0.70	0.22	----	2.18	
D25	1	1.94	0.82	0.22	----	1.17	
	100	2.04	0.84	0.22	----	2.22	
A30	14	1.93	0.52	0.21	----	1.40	
A31	9	2.08	0.70	0.16	----	1.82	
D31	17	2.05	0.67	0.17	----	2.10	
A32	1	2.05	0.72	0.18	----	1.47	
	90	1.98	0.42	0.17	----	1.82	
A33	5	1.66	0.58	0.16	1.64	1.82	
A40	3	1.88	0.60	0.25	0.98	----	
D40	42	2.13	0.82	0.23	0.52	1.08	
	78	2.08	0.92	0.23	----	2.20	
D41	50	2.08	0.92	0.22	----	2.07	
A45	11	1.80	0.53	0.20	----	----	
A46	70	1.15	0.49	0.18	----	0.86	
	99	1.30	0.71	0.19	----	1.95	
A47	6	2.11	0.36	0.18	----	1.00	
	82	2.02	0.98	0.18	----	2.02	
A49	5	2.02	0.25	0.16	----	----	
	77	2.08	0.48	0.16	----	1.90	
D49	10	2.02	0.86	0.15	----	1.14	
	77	1.92	0.84	0.17	----	1.99	
A50	16	1.46	0.44	0.16	----	1.27	
	111	2.14	1.04	0.18	----	2.12	
D50	2	1.94	0.62	0.18	----	2.08	
A51	57	1.11	0.62	0.20	----	1.02	
	94	1.90	0.89	0.17	----	1.84	
D51	8	2.03	1.00	0.17	----	2.01	
A52	9	2.00	0.88	0.21	0.82 - 0.32	1.60	
D52	17	1.82	0.92	0.24	----	1.82	
	94	1.92	0.96	0.20	----	1.70	
	159	1.82	0.82	0.23	----	2.11	
D53	31	2.02	0.98	0.22	----	1.64	
	110	2.10	0.42	0.20	----	2.10	
D54	142	1.92	0.82	0.18	----	1.00	

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<u>Pass</u>	<u>Frame</u>	<u>D Max</u>	<u>D Min</u>	<u>Gross Fog</u>	<u>Uniform Fog</u>	<u>Static D Max</u>	<u>Sun * Angle</u>
D54	70	2.05	0.92	0.21	----	1.12	
	157	2.02	0.80	0.18	----	1.28	
A63	9	1.32	0.50	0.20	----	1.08	

Average D Max 1.91
Average D Min 0.74
Average Gross Fog 0.20
Range D Max 1.11 - 2.18
Range D Min 0.25 - 1.15
Overall Range 0.25 - 2.18
Range Gross Fog 0.15 - 0.25

* The Sun Angle data was not available for enclosure in the Photographic Evaluation Report at time of publication, however, upon compilation of this data, it will be published as an addendum to this report.

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PART III - FRAMING CAMERA

Mission No: 9040 Filter: Wratten 21
Camera No: 84 Film Type: 7 J-30 (SO 130)
Camera Setting: f/6.3, 1/250 Second Evaluated By: TK, CL, ES

1. Shutter Operation: Operational for the first two frames, thereafter it malfunctions and no further imagery is obtained.
2. Exposure: Both frames show good exposure.
3. Camera Number: It is clearly registered on both frames.
4. Film Metering: The metering between frames 1 and 2 is 2.56".
5. Film Tracking: Normal throughout the mission.
6. Reseau Grid: All grid lines are well defined. In frame 1 foreign matter (possibly skiving adhering to the grid) gives the appearance of a scratch at the intersection of grid lines 9 and 11 from the leading edge, and grid line 9 from the left side of photograph.
7. Light Leaks: These are evident on the preflight portion of the film but do not appear in the two frames of photography. They appear intermittently in an area approximately equivalent to four frame lengths.
8. Static Electricity: Evidence of static may be found on the preflight but not in the two frames of photography.
9. Pinholes: These are present in the two frames of photography but are very small.
10. Abrasions and Scratches: No abrasions are present. One scratch is located in frame 1, 0.2" outboard of the first grid line between the grid lines 11 and 12 from the leading edge. In frame 2 there is a line very similar to grid line 1, from the left edge of the frame, and 0.2" inboard from it extending from grids number 4 to 16 (from the leading edge).
11. Tearing: None.
12. Water Marks: Present in frames 1 and 2.
13. Pressure Streaks: None.
14. Processing Streaks: Uneven processing was evident in the area covered by tape on frame 2. No other irregularities were present.
15. Blistering and Crimping: No blisters are present. Crimps and/or creases are found in the film preflight and in frame 1.
16. Contrast: Low 0%, medium 50%, high 50%.
Note: High contrast was determined from absolute values obtained for frame 1 and medium contrast obtained from terrain features on frame 2.
17. Apparent Resolution: Image quality is good for both frames.
18. Apparent Granularity: Evidence of granularity in the image limits this classification to medium.
19. Photo Quality: A rating of fair is given due to presence of scratches, water spots and granularity.

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20. Camera Operation: This is poor due to the malfunction after only two frames of photography.
21. Suitability for PI: A rating of fair is given due to presence of clouds in frame 1 and the granularity of the emulsion.

Remarks:

1. A portion of the trailing edge of frame 2 was covered with tape thus negating any imagery which had been present.
2. The first portion of the preflight 26.5" from the manufacturing splice is entirely black, followed by approximately four frame lengths of intermittent static and light leak patterns. From this point to the first frame of photography there is approximately 25" of film. Throughout the static and light leak patterns to the last frame (number 2) there is an alternate pattern of 2.5" of 0.71 - 0.97 density areas.
3. The two frames of photography were not of the same pass, thus no overlap was recorded.
4. Density readings were made on every frame (2) using the MacBeth Quantalog Densitometer Model EP 1000 with an EP 20 attachment. Absolute and terrain values for D Max and D Min as well as Gross Fog are given below. In addition there is also recorded the alternate fog pattern of 2.5" and a 2.1" low density area.

Frame	Terrain		Absolute		Alternate Fog Pattern	
	D Max	D Min	D Max	D Min	D Max	D Min
1			2.44	0.38		
2	1.80	0.63	3.02			

Fog Pattern	
2.5"	0.71-0.97
2.1"	0.24

Gross Fog for both frames was 0.46.

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PART IV - VEHICLE ATTITUDE DATA

Pass	Pitch Variation				Pitch Range	Roll Variation				Roll Range	No. of Frames
A01	12°	50'	13°	31'	0° 41'	-0°	22'	0°	12'	0° 34'	58
A02	13	03	14	01	0 58	-0	16	0	09	0 25	63
D07	13	16	13	58	0 42	-1	19	0	57	2 16	91
D08	13	13	14	05	0 52	-0	59	0	16	1 15	92
A09	13	35	14	05	0 30	-0	10	0	28	0 38	10
D09	13	32	14	18	0 46	-0	09	0	05	0 14	88
D15	13	27	13	37	0 10	0	08	0	26	0 18	17
A16	13	00	13	46	0 46	-1	13	2	16	3 29	85
A17	13	08	13	57	0 49	-1	10	0	53	2 03	161
D17	13	39	13	47	0 08	0	06	0	16	0 10	49
D23	13	22	14	00	0 38	-0	15	0	58	1 13	116
D24	13	15	14	26	1 11	-0	17	1	00	1 17	125
D25	13	29	13	56	0 27	-0	39	0	04	0 43	99
A30	13	39	14	02	0 23	-0	39	0	07	0 46	36
A31	13	40	14	10	0 30	-0	48	-0	06	0 42	52
D31	13	57	14	10	0 13	-0	30	-0	01	0 29	17
A32	13	34	13	50	0 16	-0	15	0	20	0 35	89
A33	13	33	14	18	0 45	-1	35	0	55	2 30	72
D40	13	41	14	06	0 25	-0	18	0	13	0 33	103
D41	13	29	13	51	0 22	-0	50	-0	05	0 45	49
A45	13	44	14	11	0 27	-0	01	0	54	0 55	36
A46	13	30	14	01	0 31	-0	55	0	08	1 03	143
A47	13	28	14	06	0 38	-0	59	-0	07	0 52	84
A49	12	56	13	48	0 52	-1	53	0	09	2 02	111
D49	13	19	14	14	0 55	-0	11	0	38	0 49	101
A50	13	21	14	24	1 03	-1	43	0	30	2 13	122
D50	13	20	13	57	0 37	-0	36	0	27	1 03	40
A51	13	16	14	04	0 48	-0	51	0	18	1 09	124
D51	13	20	14	02	0 42	-0	38	0	02	0 40	47
A52	13	10	13	34	0 24	-0	43	0	09	0 52	32
D52	13	14	14	27	1 13	-0	55	1	12	2 07	167
D53	13	09	14	13	1 04	-0	16	0	43	0 59	117
D54	13	24	14	22	0 58	-0	16	0	45	1 01	160
A63	13	22	13	52	0 30	-1	09	-0	47	0 22	27

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MISSION 9040 - DENSITY CHART
PART V

